

1. A method of making liquid crystalline polymer-copper laminates comprising laminating liquid crystalline polymer film to a copper foil, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, based on surface atomic concentration.
2. The method of Claim 1, wherein concentration of zinc is about 0.01 to about 1 atomic %.
3. The method of Claim 1, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.
4. The method of Claim 1, wherein the copper foil has a thickness of about 1 to about 72 micrometers.
5. The method of Claim 4, wherein the copper foil has a thickness of about 5 to about 40 micrometers.
6. The method of Claim 1, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

7. A method of making liquid crystalline polymer-copper laminates comprising laminating liquid crystalline polymer film to a copper foil, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic %, based on surface atomic concentration.

8. The method of Claim 7, wherein the concentration of zinc is up to about 1 atomic %.

9. The method of claim 7, wherein the concentration of zinc is zero.

10. The method of Claim 7, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

11. The method of Claim 7, wherein the copper foil has a thickness of about 1 to about 72 micrometers.

12. The method of Claim 11, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

13. The method of Claim 7, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

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14. A laminate comprising:

a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, based on surface atomic concentration;.
15. The laminate of Claim 14, wherein the concentration of zinc is about 0.01 to about 1 atomic %.
16. The laminate of Claim 14, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynaphthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.
17. The laminate of Claim 14, wherein the copper foil has a thickness of about 1 to about 72 micrometers.
18. The laminate of Claim 17, wherein the copper foil has a thickness of about 5 to about 40 micrometers.
19. The laminate of Claim 14, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

20. The laminate of Claim 14, wherein the percent loss of peel strength is less than or equal to 35% after being aged at 105°C and 5 pounds (2.3 kilograms) of pressure for 48 hours.

21. The laminate of Claim 14, wherein the percent loss of peel strength is less than or equal to 30% after being aged at 105°C and 5 pounds (2.3 kilograms) of pressure for 48 hours.

22. A laminate comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic %, based on surface atomic concentration.

23. The laminate of Claim 22, wherein concentration of zinc is up to about 1 atomic %.

24. The laminate of Claim 22, wherein the concentration of zinc is zero.

25. The laminate of Claim 22, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

26. The laminate of Claim 22, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

27. The laminate of Claim 26, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

28. The laminate of Claim 22, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

29. A circuit board material comprising
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, based on surface atomic concentration;.

30. The circuit board material of Claim 29, wherein the concentration of zinc is about 0.01 to about 1 atomic %.

31. The circuit board material of Claim 29, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

32. The circuit board material of Claim 29, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

33. The circuit board material of Claim 32, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

34. The circuit board material of Claim 29, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

35. A circuit board material comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic %, based on surface atomic concentration.

36. The circuit board material of Claim 35, wherein the concentration of zinc is up to about 1 atomic %.

37. The circuit board material of Claim 35, wherein the concentration of zinc is zero.

38. The circuit board material of Claim 35, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

39. The circuit board material of Claim 35, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

40. The circuit board material of Claim 39, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

41. The circuit board material of Claim 35, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

42. A method of making liquid crystalline polymer-copper laminates comprising laminating liquid crystalline polymer film to a copper foil, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, and a surface concentration of chromium of about 0.01 to about 4 atomic %, based on surface atomic concentration.

43. The method of Claim 42, wherein concentration of zinc is about 0.01 to about 1 atomic %.

44. The method of Claim 42, wherein the concentration of chromium is about 0.01 to about 3 atomic %.

45. The method of Claim 42, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

46. The method of Claim 42, wherein the copper foil has a thickness of about 1 to about 72 micrometers.

47. The method of Claim 46, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

48. The method of Claim 42, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

49. A method of making liquid crystalline polymer-copper laminates comprising laminating liquid crystalline polymer film to a copper foil, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic % and a surface concentration of chromium of less than or equal to about 4 atomic %, based on surface atomic concentration.

50. The method of Claim 49, wherein the concentration of zinc is up to about 1 atomic %.

51. The method of Claim 49, wherein the concentration of chromium is up to about 3 atomic %.

52. The method of claim 49, wherein the concentration of zinc, the concentration of chromium, or both is zero.

53. The method of Claim 49, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

54. The method of Claim 49, wherein the copper foil has a thickness of about 1 to about 72 micrometers.

55. The method of Claim 54, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

56. The method of Claim 49, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

57. A laminate comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, and a surface concentration of chromium of about 0.01 to about 4 atomic %, based on surface atomic concentration;

58. The laminate of Claim 57, wherein the concentration of zinc is about 0.01 to about 1 atomic %.

59. The laminate of Claim 57, wherein the concentration of chromium is about 0.01 to about 3 atomic %.

60. The laminate of Claim 57, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

61. The laminate of Claim 57, wherein the copper foil has a thickness of about 1 to about 72 micrometers.

62. The laminate of Claim 61, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

63. The laminate of Claim 57, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

64. The laminate of Claim 57, wherein the percent loss of peel strength is less than or equal to 35% after being aged at 105°C and 5 pounds (2.3 kilograms) of pressure for 48 hours.

65. The laminate of Claim 57, wherein the percent loss of peel strength is less than or equal to 30% after being aged at 105°C and 5 pounds (2.3 kilograms) of pressure for 48 hours.

66. A laminate comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic % and a surface concentration of chromium of less than or equal to about 4 atomic %, based on surface atomic concentration;.

67. The laminate of Claim 66, wherein the concentration of zinc is up to about 1 atomic %.

68. The laminate of Claim 66, wherein the concentration of chromium is up to about 3 atomic %.

69. The laminate of Claim 66, wherein the concentration of zinc, the concentration of chromium, or both is zero.

70. The laminate of Claim 66, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

71. The laminate of Claim 66, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

72. The laminate of Claim 71, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

73. The laminate of Claim 66, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

74. A circuit board material comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of about 0.01 to about 2 atomic %, and a surface concentration of chromium of about 0.01 to about 4 atomic %, based on surface atomic concentration;

75. The circuit board material of Claim 74, wherein the concentration of zinc is about 0.01 to about 1 atomic %.

76. The circuit board material of Claim 74, wherein the cocentration of chromium is about 0.01 to about 3 atomic %.

77. The circuit board material of Claim 74, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

78. The circuit board material of Claim 74, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

79. The circuit board material of Claim 78, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

80. The circuit board material of Claim 74, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.

81. A circuit board material comprising:
a copper foil and a liquid polymer film laminated thereto, wherein the copper foil has a surface concentration of zinc of less than or equal to about 2 atomic % and a surface concentration of chromium of less than or equal to about 4 atomic %, based on surface atomic concentration.

82. The circuit board material of Claim 81, wherein the concentration of zinc is up to about 1 atomic %.

83. The circuit board material of Claim 81, wherein the concentration of chromium is up to about 3 atomic %.

84. The circuit board material of Claim 81, wherein the concentration of zinc, the concentration of chromium, or both is zero.

85. The circuit board material of Claim 81, wherein the liquid crystalline polymer film comprises a hydroxy benzoate/hydroxynapthoate copolymer having a thickness of about 25 micrometers to about 500 micrometers.

86. The circuit board material of Claim 81, wherein the copper foil has a thickness of about 1 to about 50 micrometers.

87. The circuit board material of Claim 86, wherein the copper foil has a thickness of about 5 to about 40 micrometers.

88. The circuit board material of Claim 81, wherein the copper foil further comprises a dendritic layer, a hydrophobic layer or both.